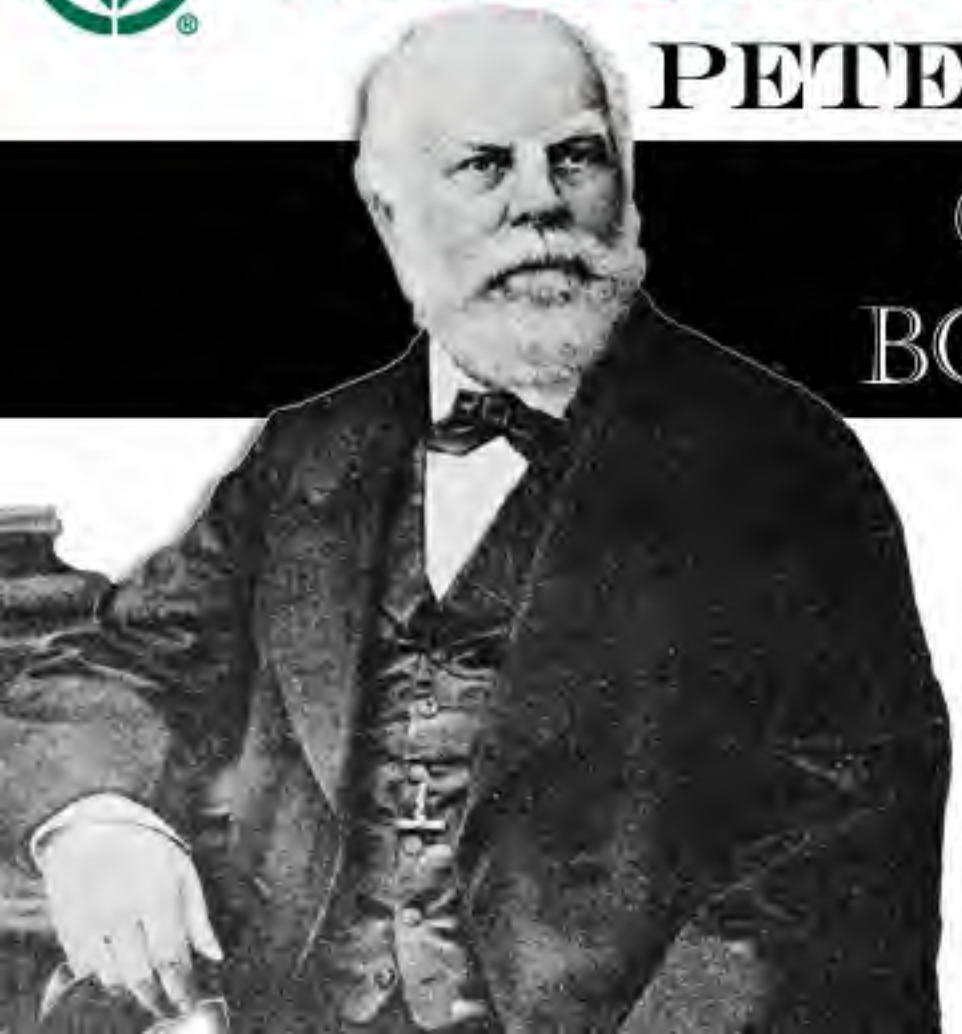
Missouri Botanical Garden
Peter H. Raven Library

George Engelmann Botanical Notebooks



Pagination Note:
Since many of the items lack a specific page number, the page number displayed online refers to the sequentially created number each item was given upon cataloging the materials.

develop into bamboos and canes, and large orchids and palms abound. Most of the vegetable growth of this zone lies to the north of the equator. It may be described as covered with very dense evergreen forests.

2. *The Tropical Zone,* extending to the isotherm of 73½° on both sides of the equator, and abounding in palms, tree-ferns, cotton, coffee, and sugar-cane, as well as bananas. Here the climbing plants decrease, and underwood becomes more abundant.

3. *The sub-Tropical Zone,* bounded by the isotherm of 63°. This belt is rich in magnolias, myrtles, laurels, figs, palms, cacti, vines, and arborescent euphorbias. The vegetation is for the most part evergreen. The climate of this zone is splendid, but in some places it is rainless.

4. *The higher Temperate Zone,* called also the warmer temperate, and limited by the line of 53½°. There is still an abundance of evergreen trees, but few or no palms. Here are fine forests of deciduous trees,—oaks and chestnuts, olives, pomegranates, figs, oranges, and the vine. These abound chiefly in the zone of the northern hemisphere, while in the southern we meet with araucarias, some ferns, and arborescent grasses.

5. *The lower or colder Temperate Zone,* extending to 42½°. This ir

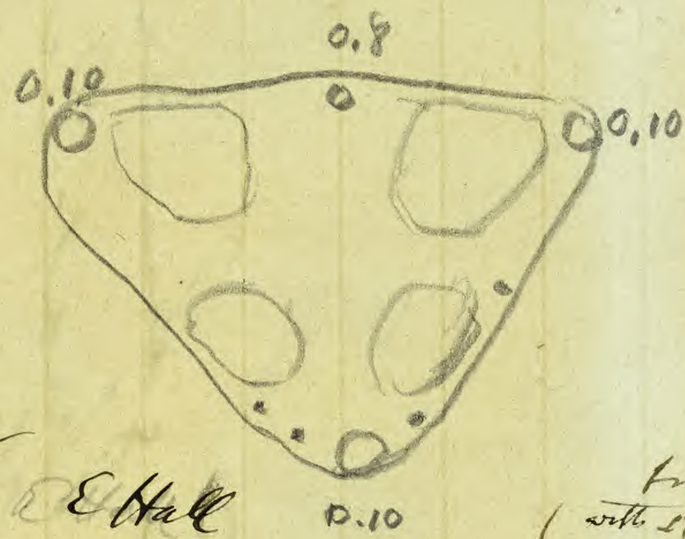
The climate of any country is spoken of either as *geographical*—dependent upon latitude—or *physical,* which depends more upon the situation and aspect. The distribution of species mainly follows the first of these, and the quality and growth of timber the second. The extensive growth of timber in any district tends to minimise changes, as the temperature in summer is lowered by the shade of the trees, while the checking of terrestrial radiation in winter considerably decreases the cold. Forests also break the force of the winds and give a more humid atmosphere.

Any one country may present great varieties of climate which are characterized by as many distinct growths of trees. In France 330 feet of elevation reduces the heat equivalent to one degree of latitude; and Professor Bagneris, who has devoted great attention to the timber growths of that country, divides it into the following districts:—1. Hot climate, producing oaks (*Quercus suber, ilex,* and *coccifera*) and pines (*Pinus halepensis* and *pinea*); 2. Mild climate, growing *P. pinaster* and *Q. sessiliflora* and *pedunculata;* 3. Temperate, growing oak, hornbeam, and beech; 4. Cold, producing beech and silver and Scotch firs; 5. Very cold, growing the sorbus, pyrus, betula,

13863

cm 0 1 2 3 4 5 6 7 8 9 10
copyright reserved
MISSOURI BOTANICAL GARDEN

transpart with stomata	green no stomata	transpt with stomata	green no stomata	transpt with stomata	green no stomata
0.280 mm	0.630 mm	0.280 mm	~~0.805~~ 0.735	0.280	0.630
					0.105
Key wide	0.105		0.017. 0.035. 0.105. 0.052		0.035 ~~0.070~~



1872

melanopoda var

Scotes Ivy ms E Hall

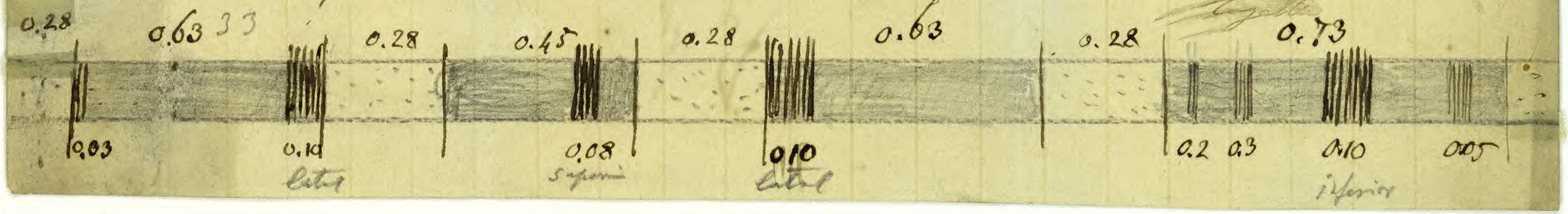
magnified 57 times

circumference of cap 3 1/2 mm

transpt part, with stomata 0.280

green part, no stomata 0.455

0.077



0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

13864

Dr. Engelmann
South Mus. Comm
6th & Pine
City.

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

Sorites melanopoda

Dec 24 1877

End of a dried up stream

G D Butler Indian Territory Dec 16 77

$\frac{17-24}{60} = 0.29-0.40$ mm

×150

150

×150

macrospores more prominently marked than usual in this specimen

Other specimens have the same strongly marked spores some of them

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

13865

Deutsche Apotheke.

GEO. UDE,

Apothecary and Druggist

No. 3610 North 10th Street,

Between Mallinckrodt and Salisbury, **ST. LOUIS, MO.**

No. *187*

For .....

℞.

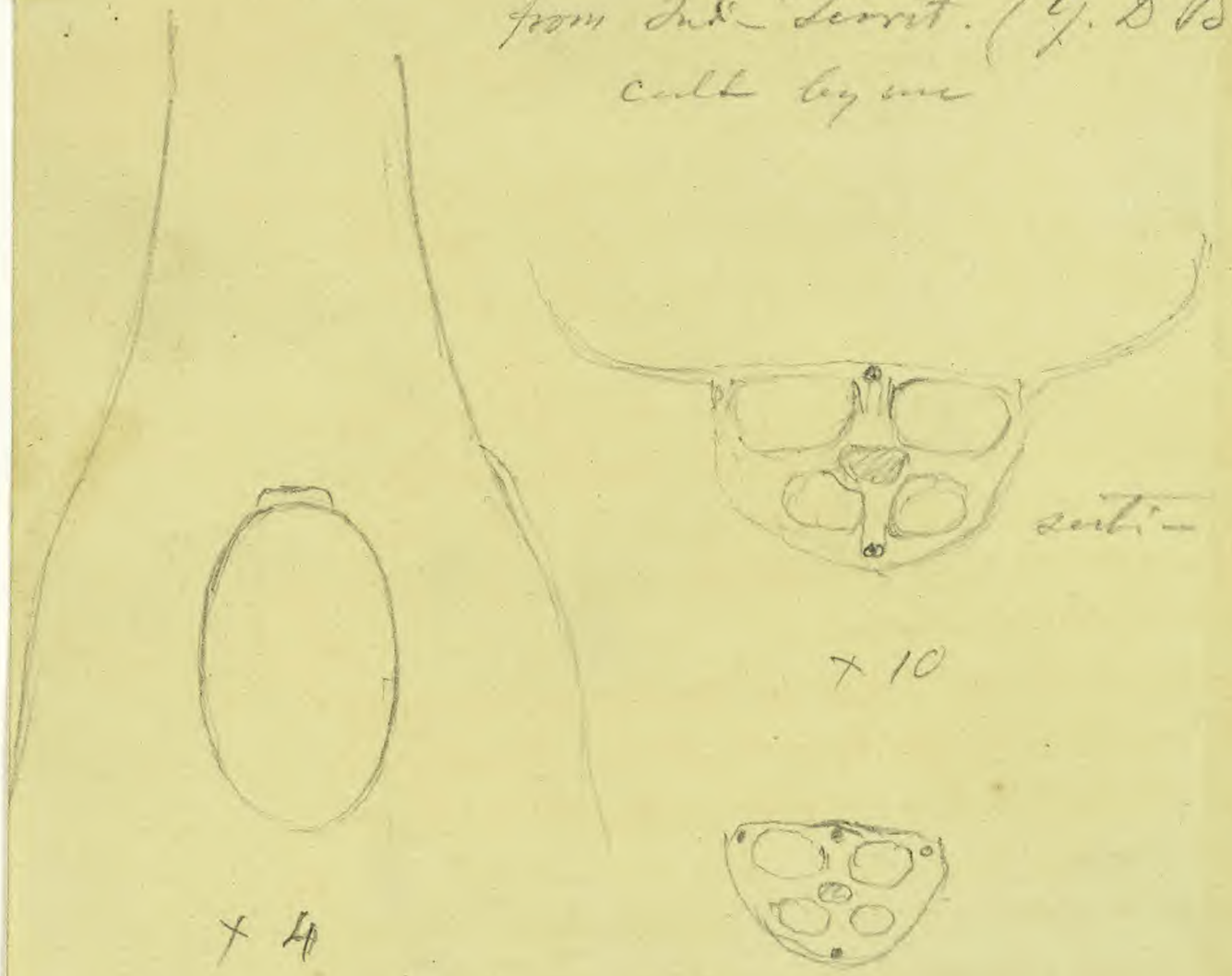
cm 0 1 2 3 4 5 6 7 8 9 10
copyright reserved
MISSOURI BOTANICAL GARDEN

Dec 24 1877

Ascetes

from Ind. Territ. (J. D Butler)

coll by me



× 10

× 4

Ligula brevissima
retusa

leaf 7 inches long
no velum
largest spores 0.40 mm
immature – nearly 0.35 mm
very unequal – ridge
stomata
sutic– 1 inch above base – 4 of them in a row

size of leaf and spores
point to melanopoda
absence of velum to Butleri

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

13866

Deutsche Apotheke.

GEO. UDE,

Apothecary and Druggist,

No. 3610 North 10th Street,

Between Mallinckrodt and Salisbury, **ST. LOUIS, MO.**

No. *187*

For .....

℞.

0 cm 1 2 3 4 5 6 7 8 9 10
copyright reserved
MISSOURI BOTANICAL GARDEN

Boeckeria melaenopoda

Limestone gap. Sandy Township July 11 1875

Dec 1875

25 – 30 leaves

10 – 14 inches long

base black

$\frac{16.5 - 21.2}{60} =$

0,28 – 0.35 mm

×60

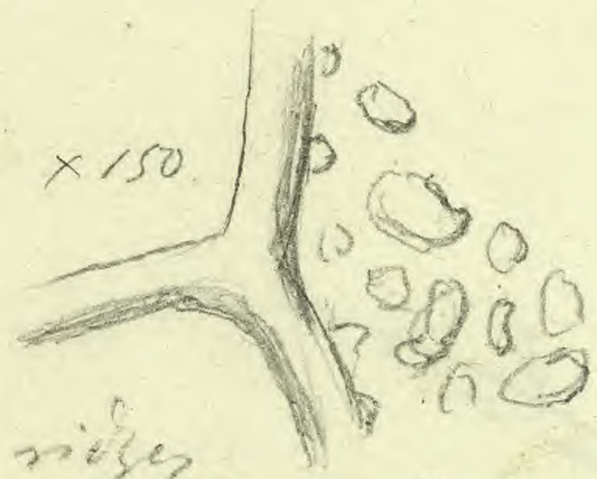
May 1877

macrosp. 0,23 – 37 mm

microsp. 0.026 – 0.031

leaves 20 – 40

7 – 10 – 14 cm long



×150

ridges

perfectly smooth

mesh elevated

×2

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

Leitch & Corlies

DRUGGISTS

South-west Corner Fifth and Market Streets

13867

cm 0 1 2 3 4 5 6 7 8 9 10
copyright reserved
MISSOURI BOTANICAL GARDEN

Isoetes melanopoda Dur. 13 IX 77

Indian Territory

Butler

10½ – 12½ 0.025 – 0.030 mm

415
warty

large plant 10 inches long

1877

11–12 0.026 – 0.029 mm

415
warty

small plant 4-5 inches

1875

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

13868

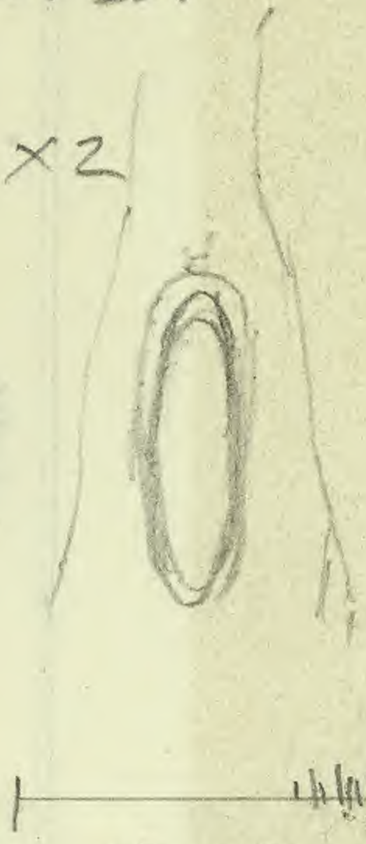
0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

Jan 1874

Isoetes melanopoda, Gay,

G. D. Butler, India—Terr. Jan 1874

×2



Spores 0.35—0.44 mm diam—

Leaves 25 to 40 cm long

Same region, Jan 1875
by same collector

$\frac{17-22}{60}$ < length < $\frac{33}{60}$ m

= 0.28—0.37 mm 0.55 m.

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

13869

R. C. HARRISON,

508 Leffingwell Avenue,

Druggist & Apothecary

G. F. ENGLEMAN, M.D.,

3003 Locust Street.

Missouri Botanical Garden
0 1 2 3 4 5 6 7 8 9 10 cm
copyright reserved

Aug 20 1875

Isoetes

Limit — gen. Bot. Soc. Torrey J. D. Baldwin

Aug 15 1875

diam. macrospores

14–22 / 60 = 0,23 – 0.3⟩ mm

mostly abt 0.30 mm

10½–12

0.025–0.029

mm

ridges always smooth & stout

surface of 6 different spores ×150

with smaller & larger, more confluent, vermicular or isolated, or almost reticulated tubercles & wrinkles, or (5×6) almost smooth

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

HOELKE BROS.,

APOTHECARIES AND CHEMISTS,

S. W. Cor. Sixth & Market Sts.,

ST LOUIS, MO.

12870

0 cm 1 2 3 4 5 6 7 8 9 10
copyright reserved
MISSOURI BOTANICAL GARDEN

Nachtrag An Braun

Ich erwähne ich selbst die im Laufe des vorigen Jahres öfters Exemplare erhaltene [illegible] Isoetes Malinverniana, welche Herr Prof. Gennari in Mailand gefunden hat, daß ich [illegible] bei Triest [illegible]

5 Juni 1865 Ist sie [illegible] Isoetes hat in einer Localität bis Anfang May kein Wasser gehabt. Als [illegible] Exemplare [illegible] in Weingeist aufbewahrt, ist [illegible] 6 Zoll hoch und [illegible] 8–12–18 Zoll lang (die längsten die [illegible]) auf kaum [illegible] Stücke [illegible]

Wasser [illegible] Exemplare [illegible] Gürtel [illegible] die tiefsten Mitte des Sees; wenn der Wasser fällt, [illegible] die längsten Blätter [illegible] Oberfläche [illegible] Ufer in Massen auf den Boden, [illegible] Gürtel [illegible] die tiefsten [illegible].

19 Juni Ist sie trockener Boden; Isoetes alle ist ein Trockenen; da der Wasser ist von allen Plätzen [illegible] nicht zurückgezogen [illegible]. Auch die trockenen Plätzen sind die Blätter [illegible] abgestorben; Mitte Juni [illegible] Boden [illegible] — Isoetes nicht alle, [illegible] — [illegible] neuen [illegible] alle Wasser [illegible] — Ein [illegible] ein Mitt gezogen [illegible], in der ein Fuß lang Wasser stand, war voll Isoetes — keine [illegible] in der Nähe.

29 Juli Da der Wasser am tiefsten, sind die Blätter [illegible] ganz [illegible] —

10 July Alle Isoetes todt, alle Blätter (roads)

[illegible] [illegible] [illegible] [

J. melanopoda

156-163

istence on this earth concerns
ture is expected to be drawn
education, to that degree is
challenged to activity and s

In the highest sense of th
can worship God by himse
when with others. Social
becomes of the highest impo
to find God is a search wel
When one goes into his cl
door and prays to his Fathe
done appropriately, God will
The results of that search sh
strength of purpose, in increa
tional zeal on his behalf for
his fellows.

But secret prayer does not
ments of worship. To wo
one's sense of the worthines
ship is worth-ship. It mean
reverence does so because o
alted worth or worthiness
enced. In this estimate one
ly to perform the act satisfac
sociation with others who
with him to do the same thin
selves together, therefore, fo
ship is in every way comm
women.

In this country both by r
that it is a duty and because
attaching to it on account o
venience, a day is set apart

others for almost any purpose which is
bly good, carries along with it transien
very many instances, permanent benef

The social qualities of human nature
ally with persons constituted as for t
part Americans are, need culture. T
not be had unless persons frequently m
interchange courtesies and exchange t
and receive and give out impressi
which the inter-communicative faculties
man nature can be quickened, strengthe
cultivated. In no way can the social f
man be put to use to greater advantage
or under forms of worship. Here, ind
ity expresses itself feebly, while those
which are designed to bring out and gi
sideration to subjects in whose further
human beings have more or less of com
terest, are exercised and made to take
vigor and strength. Besides, only thro
culture of the social nature of man can
itual nature be freely developed. S
things are not organized so as to benefit
ular persons exclusively. In all spiritua
all persons have common interest and
equal rights.

The spiritual kingdom described by th
Heaven in the Bible, is a place where no
dwelling within it can have exclusive
anything. There the in-dwellers hold
thing in common. There the great ele
labor, whatever be its form or nature
itself up into grand results only throu

English Gray 1870: p. 677

Leaves 15-50 — 6-10" long

marrow 0.14-0.18" (0.28-0.36 m)

Spinal nerves 0.010-0.012" (0.022-0.024 m)

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

13872

…nd impart unto them of this great be… …ent, cannot afford to appear before them …ter upon the great labor which his voca… …poses, more than once in a day.

…ual inspiration is as exhausting in its outflow as it is exalting in its accumulation. He who is breathed upon by the spirit of God takes on strength. He who dispenses this strength to others is made weak thereby. The minister's preparations for the Sabbath are tonic; his labors on that day are greatly enfeebling. He therefore cannot as a general thing come to his pulpit prepared to communicate to his congregation in such a way as greatly and permanently to benefit them, without himself being much weakened. All clergymen who are spiritually minded know this to be a fact. When they have gone through with their public duties they are exceedingly tired. Very few of them can reappear on the same day without physical detriment to themselves.

As ministers of the gospel of all denominations in the United States are as a general thing compelled as yet by the low tone of public sentiment in respect to the dignity of their position and their worth to the people, to hold sacrificial relations, by which I mean relations where they have great duties to do with comparatively small compensations and rewards therefor; as they are also compelled by public opinion to

…ably to them …
…ed for the occasion and his utterances are largely charged with spiritual power. When he has parted with this power he is of no service to his congregation until he has become re-charged with it; and as a general thing ministers thus endowed get rid of all this peculiar quality of force at one sitting of the people. When a man has had an opportunity to pour out Divine magnetism from every nerve of his body upon a congregation for an hour, he is then better fitted to spend the balance of the day in his own house, or out on the highway, or in the fields about him, or up on the mountain side, or down in the heart of a valley, or by the banks of some gentle stream, or in quiet, social intercourse where his family and his friends give him sympathy, friendship and love, than he is to return to his pulpit and seek anew and afresh to give his people spiritual baptism.

Second, if one effort on a Sunday exhausts a minister the rule applies with equal force to his congregation. All of God's inbreathings on man's higher nature, no matter by what methods they are communicated, require to be legitimately taken in and appropriated if the greatest good is to come to man thereby.

There is such a thing as spiritual dyspepsia. The spiritual faculties become plethoric and

Missouri Botanical Garden
copyright reserved
cm 0 1 2 3 4 5 6 7 8 9 10

1, Rhodes Road, Post Bridge, Thurlow.
2, Colebrook, Connecticut, Robbins No 13
3, Uxbridge, Robbins Hagen (Uxbridge is mistake)
and same as above
4, Clarks Town, Battle Comp., Frost (Wain.
5 Battle Comp. & B. & Hc Gray
6, New Haven, Tidal shore, Eaton
7. Passaic " " Lamp

1,	0.43 – 0.48	0.027 – 29
2,	0.38 – 0.45	23 – 24
3,	40 – 47	
4	45 – 52	22 – 25
5	38 – 45	25 – 28
6	37 – 44	25 – 28
7	40 – 47	

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

13873

ALEX. LEITCH.

APOTHECARY & PHARMACEUTIST.

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.

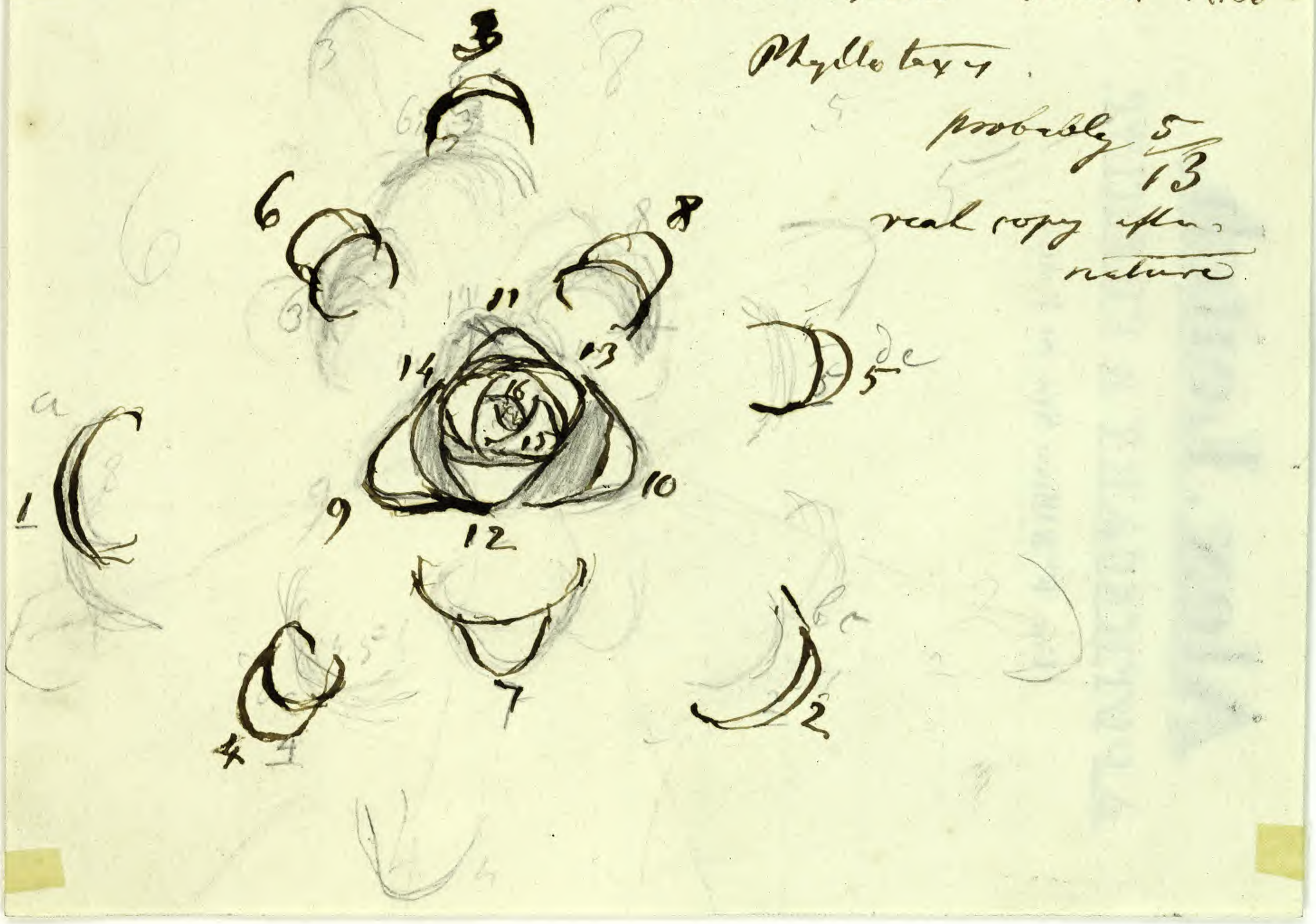
0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

Fronton melanopoda June 4 1866

Phyllotaxy.

probably 5/13

real copy after nature



Alex. Leitch,

APOTHECARY & CHEMIST,

Cor. 4th & Olive Sts., St. Louis.

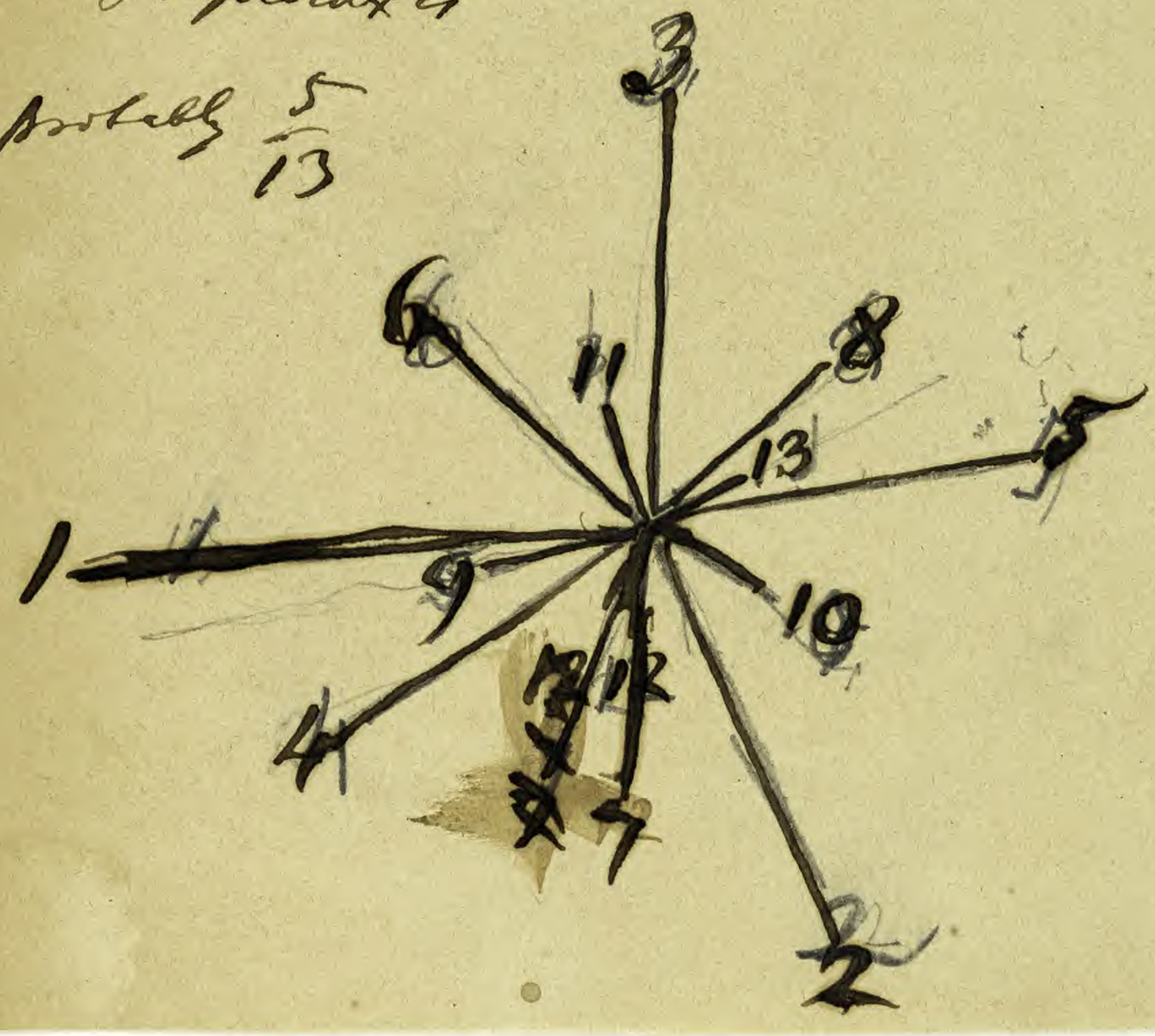
13874

cm 0 1 2 3 4 5 6 7 8 9 10
copyright reserved
MISSOURI BOTANICAL GARDEN

Isoetes melanopoda June 4 1866

Phyllotaxis

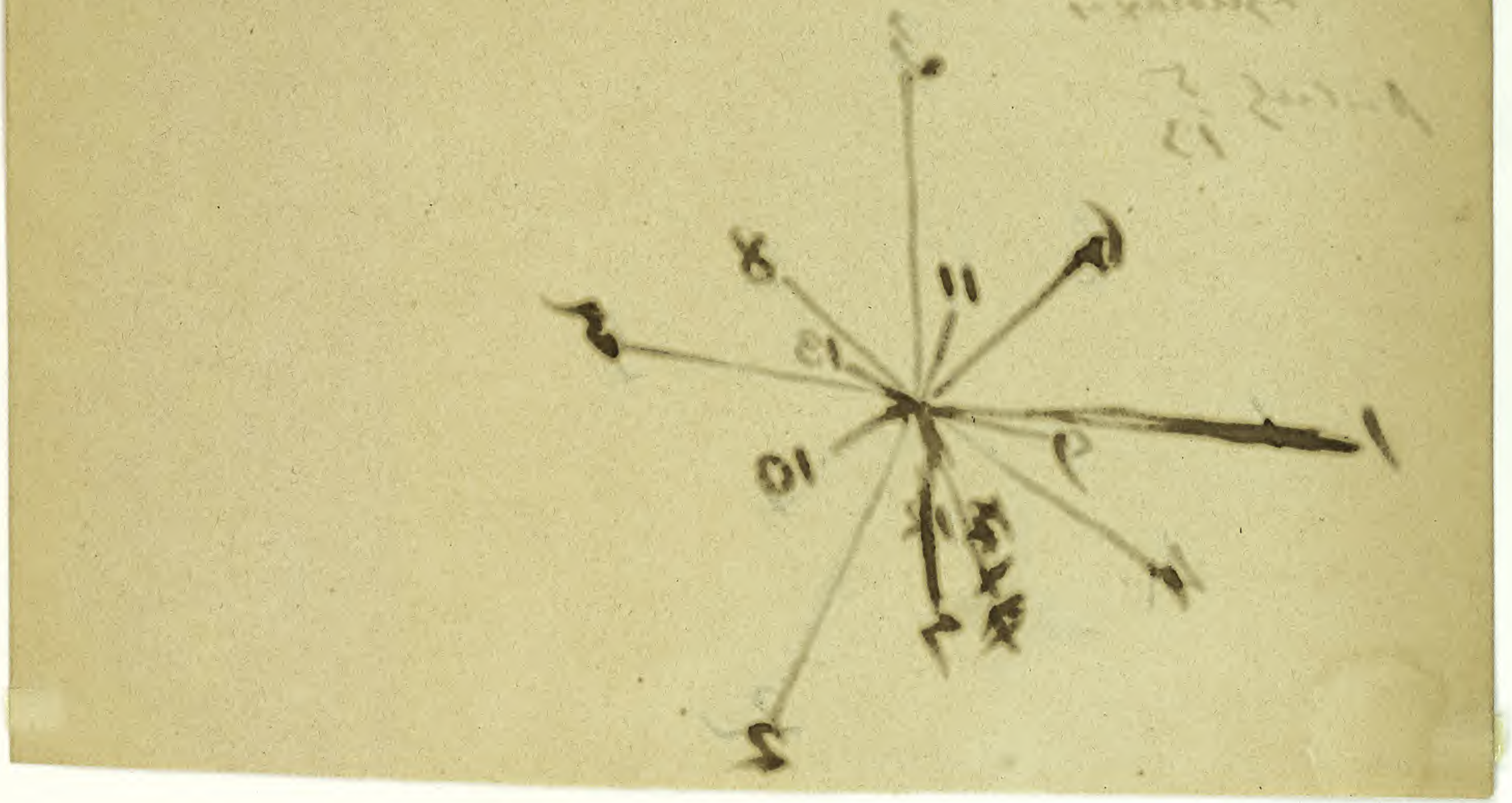
probably 5/13



ALEX. LEITCH
APOTHECARY & PHARMACEUTIST
COR. 4TH & OLIVE STS. ST. LOUIS

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

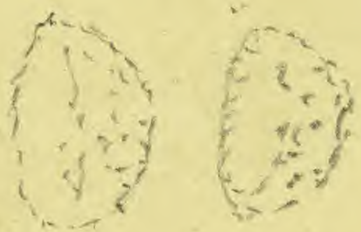
13875


1
2
3
4
5
6
7
8
9
10
11
12
13

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

I. melanopoda Aug 11 1875

Athens Ill, E. Hall Nov. 1865



$\frac{12 \div 13}{415} = 0.029 - 0.031$ mm

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

KE BROS.,

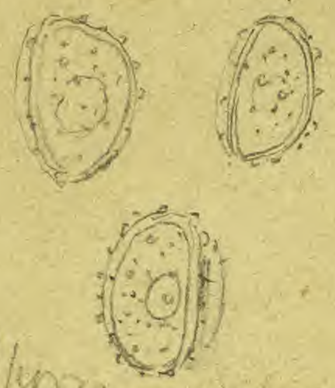
S AND CHEMISTS,

xth & Market Sts.,

LOUIS, MO.

cm 0 1 2 3 4 5 6 7 8 9 10
copyright reserved
MISSOURI BOTANICAL GARDEN
94831

Isactis melanopoda Aug 27 1865.
for Athens.
fresh plants cultured
under water



Small spiny
pink —
Mass looking like a
fine mud
0.023 – 0.025 mm
long

×60

×415

Spores 0.30 – 0.36 mm
with very slight ridges
and minute & delicate
reticulated ridges
especially on the outer
or broad half — scarcely
any on the inner or upper
side

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

ALEX. LEITCH.

ECARY & PHARMACEUTIST,

uilding Cor. Fourth & Olive Sts. St. Louis, Mo.

13877

0 1 2 3 4 5 6 7 8 9 10 cm
copyright reserved
MISSOURI BOTANICAL GARDEN

Isoetes melanopoda Sept 21 1866

Dixie plant, mch. for Athens Ala

×280

Stomata rare
in pits several
together

×10 scale of leaf

upper cavities
smaller than
posterior ones

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

ALEX. LEITCH

APOTHECARY & PHARMACEUTIST

& DEALER IN

ALL FINE FRENCH & ENGLISH CHEMICAL PREPARATIONS.

Cor. 4th. & Olive Sts. ST. LOUIS.

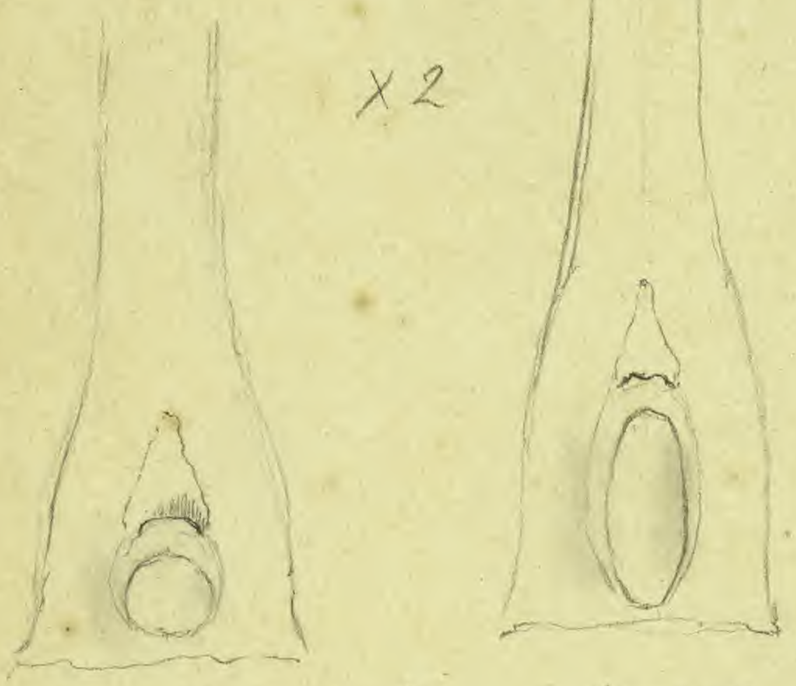
13878

0 1 2 3 4 5 6 7 8 9 10 cm
copyright reserved
MISSOURI BOTANICAL GARDEN

Isoetes melanopoda Sept 16. 1866

Leaves of same specimen from dry specimen rec'd. June 1st

Athens, Ala



X 2

one of the exterior leaves with macrosporangia

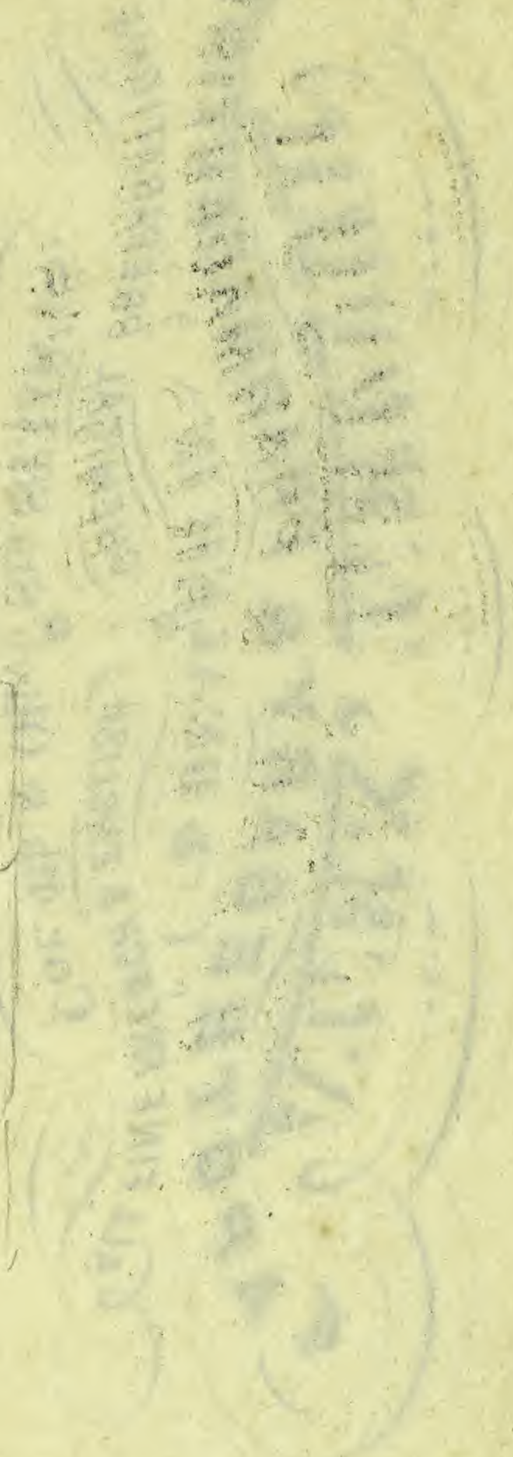
inner leaf with microsporangia

Sporangia in larger specimen from 4 – 10 mm Coog

X 415

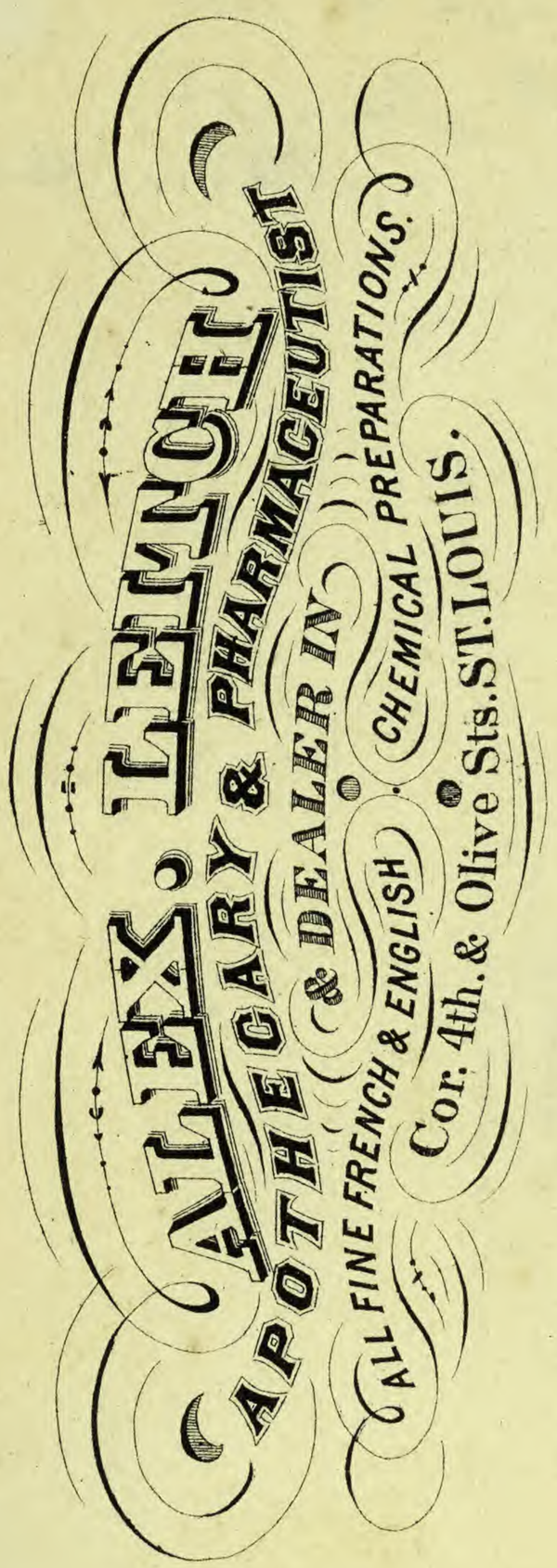
andospores, dry

0.027 – 0.028 mm



0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

13879


CALLEY & LEMMON
APOTHECARY & PHARMACEUTIST
ALL FINE FRENCH & ENGLISH & DEALER IN CHEMICAL PREPARATIONS.
Cor. 4th. & Olive Sts. ST. LOUIS.

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

Sept 7 1865

Isoëtes melanopoda

cultivated on wet but not
overflowed soil, leaves 4 inches long
Sporangia all male

x5

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

ALEX. LEITCH,

APOTHECARY & PHARMACEUTIST,

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.

13880

0 cm 1 2 3 4 5 6 7 8 9 10
copyright reserved
MISSOURI BOTANICAL GARDEN

Isoetes melanospora Sept 7 1865

cultivated under water, 2 inches deep.

all male sporangia!

females formed earlier in season, and now decayed.

leaves 7–8 inches long.

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

ALEX. LEITCH,

APOTHECARY & PHARMACEUTIST,

Marble Building Cor. Fourth & Olive Sts. St. Louis, Mo.

13881

0 1 2 3 4 5 6 7 8 9 10 cm
copyright reserved
MISSOURI BOTANICAL GARDEN

Isoetes melanopoda

Saline flats Limestone Gap, Ind. Terr.

J. D. Butler Jun 1877

Abot 2/3 of 100 specimens were dioecious and 1/3 monoecious (1/3 male and 1/3 female) Males mature earlier than the male spores of monoecious plants.

June 14th I gathered 138 specimens of I. melanopoda (all that I could find in one pool)

36 male 54 female 48 monoecious a few of the latter had very few external female sporocases.

Macrospores originate in watery juice

Microspores in milky liquid

[Optical illusion?]

July 8 '77. J. D. Butler

(Isoetes Butleri all gone)

I. melanopoda is later; in a ditch in a field all sp. were dioecious.

The monoecious specimens collected in a pool where food is much more scarce than is usual for the plant — in most instances in very wet places. Is this the rule? are the monoecious in wet and the dioecious in dry localities? It does not seem so, after extensive observations.

0 1 2 3 4 5 6 7 8 9 10 cm
copyright reserved
Missouri Botanical Garden

Dear Dr.

Will you please come over this afternoon some time I have taken a little cold & it has settled in my breast. I should like to know what to do before it gets worse.

Yours truly,
Mrs. Chas. Bissell

1388234

I filled everything. The one this morning at 9 o'clock & the one at noon Tuesday at 2 o'clock. I have not had a chance to think of the one difference in the trees rather small to the trees more rather small to my hate.

Yours
Attorney

1388213

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
Missouri Botanical Garden

Dear Engelmann

I only add my heartiest greetings to the letter of Dr. Garesche. Thanks for the detailed letter, specially the one with Isoetes melanopoda. I have examined this species now exactly,, and was about to write to you and Hall about it, when I became indisposed, really not very sick, but I can not leave the bed, for first Salversal, then abdominal, and then rheumatic problems, which have all gone, a.....and promptly./ recurring fever has remained, which I now try to cure with Lhinum (?). The Innan essays I have ordered from two antiquarians. Letter to Caspari taken care of immediateky. Hopefully I can soon get to our writing.

Your A. Braun

(translated from German script by Edgar Denison, June 1988)

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

(translated from German script by Egbert Harrison, June 1964)

Kont A. Braun

Kv. Hopefully I can soon key to cont multiply.

from two multiplications. Letter to Casperli taken care of immediate-

now fly to cute with Lhimmm (?). The Iman observe I have ottered

have all none. S..... and promptly. tevet has remained, mitch I

TTest Selvestral. Even Mathematic and Even Instrumento problems, mitch

hisbored, really not very sick, but I can not leave the bed, for

and new about to Mlfe to Kon and HALL about it, when I became im-

Isoetes .Helgnon.... I have examined this species now exactly,

tesache. Thanks for the general letter, specially the one with

I only add my heartiest wishes to the letter of Ly. Ca-

Best wishes

13873

note book 44
folder 20

21/2 66

Lieber Engelmann!

Ich fing den Distelfalter
Dr. gaedebe [illegible]
[illegible] Gruß das [illegible]
Brake für die Sammlung Rist
[illegible] mit Vanessa milberg. melano-
Ich habe die Art jetzt genau poda
untersucht, aber im Bestimmen E.D.
sind Hall [illegible] sehr
ich mich wirklich [illegible]
ich [illegible] 3 Arten, [illegible]
[illegible] kenne, aber doch [illegible] der
Art auf [illegible], die auf [illegible]
[illegible]. Die [illegible], die
Männer sind, [illegible] prompt
[illegible] gehalten
[illegible] mit [illegible]
[illegible]. Die Imago-[illegible] [illegible]
bei 2 antiquen [illegible]. Die
von Caspary [illegible].
[illegible] [illegible].
[illegible]! Ihr [illegible]

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

13884

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

Martha:

Date of letter ? the $\frac{21}{2}$ 66 on top left may mean Feb.21, 1866 ? the Arival & answered dates a illegible on the xerox copy.

E.Denison
June 1988

Folder # ?

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN

13885

0 1 2 3 4 5 6 7 8 9 10
cm
copyright reserved
MISSOURI BOTANICAL GARDEN